What is claimed is:

1. A storage device comprising:
a probe; and
a substrate comprising a storage medium and heating elements,
the heating elements adapted to heat respective regions of the storage medium to form perturbations in the respective regions of the storage medium,
the probe adapted to detect the perturbations.

2. The storage device of claim 1, wherein the perturbations comprise dents, and wherein the probe is adapted to form dents during write operations in regions of the storage medium that have been heated by respective heating elements.

3. The storage device of claim 2, wherein the storage medium has plural storage cells made up of the respective regions of the storage medium, the heating elements being associated with respective storage cells.

4. The storage device of claim 3, further comprising select lines to select one or more of the heating elements,
the select lines to activate at least one of the heating elements to heat a region of the storage medium corresponding to one of the storage cells to perform one of writing and erasing.

5. The storage device of claim 4, wherein the select lines are provided in the substrate.

6. The storage device of claim 5, wherein the substrate further comprises a first layer containing a first set of select lines, and a second layer containing a second set of select lines.

7. The storage device of claim 3, wherein the heating elements are adapted to heat respective storage cells to erase data stored by the storage cells.

8. The storage device of claim 1, wherein the substrate comprises a layer making up the storage medium, the layer between the probe and the heating elements.

9. The storage device of claim 8, wherein the layer is formed of a material containing polymer.

10. The storage device of claim 8, wherein a selected one of the heating elements is adapted to melt a region of the layer to enable the probe to form a dent in the melted region.

11. The storage device of claim 1, wherein the heating elements comprise resistive elements.

12. The storage device of claim 1, wherein the storage medium has plural storage cells made up of respective regions of the storage medium, wherein each of the heating elements is adapted to heat a respective group of plural storage cells.

13. The storage device of claim 1, wherein the heating elements are adapted to deactivate to cool the respective regions of the storage medium, wherein a rate of cooling of the respective regions of the storage medium affects the crystallinity of the respective regions.

14. The storage device of claim 13, wherein deactivation of a first heating element to cool a first region of the storage medium at a first rate causes the first region to have an amorphous structure, and wherein deactivation of a second heating element to cool a second region of the storage medium at a second, slower rate causes the second region to have a crystalline structure.

15. The storage device of claim 14, wherein the probe is adapted to detect the amorphous structure of the first region and the crystalline structure of the second region based on detected resistances associated with the first and second regions, wherein the crystalline structure has a lower resistance then the amorphous structure.

16. The storage device of claim 1, wherein the perturbations comprise bumps formed above a surface of the storage medium, the bumps caused by heating of respective heating elements.

17. A system comprising:

a processor; and

a storage device comprising:

a probe, and

a substrate comprising a storage medium and heating elements, the storage medium having plural storage cells,

the heating elements adapted to heat respective storage cells for programming the storage cells,

the probe adapted to read storage cells.

18. The system of claim 17, wherein the probe is adapted to be scanned across a surface of the storage medium to read the storage cells.

19. The system of claim 18, wherein the storage device further comprises an actuator to move the substrate to cause scanning of the probe across the surface of the storage medium.

20. The system of claim 19, further comprising a probe substrate on which the probe is formed, the probe substrate further comprising additional probes to read the storage cells.

21. The system of claim 17, wherein heating by the heating elements causes perturbations to be formed in storage cells that are heated,

wherein the probe is adapted to detect the perturbations to determine a data state.

22. The system of claim 21, wherein the probe is adapted to form a dent in a storage cell that has been heated by a corresponding heating element.

23. The system of claim 22, wherein the heating element is adapted to melt a region of the storage medium corresponding to a storage cell to enable the probe to imprint a dent into the melted region.

24. The system of claim 17, wherein the heating elements comprise resistive elements.

25. The system of claim 24, wherein the storage device further comprises select lines to activate the resistive elements, and

peripheral circuitry to activate the select lines.

26. The system of claim 25, further wherein the select lines comprise electrically conductive traces in the substrate.

27. The system of claim 17, wherein the probe has a tip to interact with a heated region of the storage medium to form a respective perturbation during a write operation.

28. The system of claim 17, wherein the heating elements are adapted to heat respective storage cells to erase the storage cells.

29. The system of claim 19, wherein the probe comprises a nanotechnology probe.

30. A method of storing data in a storage device, comprising:

activating heating elements provided in a substrate to heat respective regions of a storage medium that is formed in the substrate;

forming perturbations in regions of the storage medium by heating the selected regions with respective heating elements; and

detecting the perturbations with a probe.

31. The method of claim 30, wherein activating the heating elements comprises activating resistive elements.

32. The method of claim 31, wherein activating the resistive elements comprises causing electrical current to conduct through the resistive elements.

33. The method of claim 29, wherein forming the perturbations comprises forming dents.

34. The method of claim 29, wherein forming the perturbations comprises forming bumps.

35. The method of claim 39, wherein forming the perturbations comprises forming at least one of an amorphous structure and a crystalline structure in a selected region of the storage medium.